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IN RE UNITED STATES PATENT APPLICATION

FOR

MULTI-DENSITY LASTING BOARD

OF

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MULTI-DENSITY LASTING BOARD

FIELD OF THE INVENTION

The present invention relates to shoes and, more particularly, to a sport shoe with a multi-density lasting board.

BACKGROUND OF THE INVENTION

Shoes have been specialized and improved for years. Currently, shoe manufacturers and designers provide specialized shoes for many activities, such as, for example, running shoes, tennis shoes, cycling shoes, walking shoes, and cross-trainers. These shoes can be designed to respond to particular pressures and hot spots for the assumed usage.

However, shoe soles and/or inserts are typically designed as a largely consistent piece of rubber, typically a foam, or gel. While the consistent sole may be shaped and conformed to an individual's foot anatomy and is generally satisfactory, the cushion or support provided by the sole does not take into account different actions of the foot. As used in this application, the term cushion could mean more or less cushion depending on context. For example, during running, the metatarsal and heel portions of the foot are generally exposed to higher impact forces than the arch or instep. But the cushion or support provided by conventional shoe soles is uniform, despite this difference. Further, the toes are subject to pronation, but the sole or insert does not alter its cushion or support to help combat pronation.

In light of the above, it would be desirous to develop a multi-density lasting board or insert to provide varying cushion or support over the foot.

SUMMARY OF THE INVENTION

To attain the advantages and in accordance with the present invention, a shoe is provided. The shoe comprises a sole and an upper forming an

interior foot portion and an exterior portion. A lasting board formed to overlay a sole portion in the interior foot portion comprises a first density foam portion and a second density foam portion. The second density is substantially contained in the first density foam portion and provides different cushioning over the sole.

The foregoing and other features, utilities and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the present invention, and together with the description, serve to explain the principles thereof. Like items in the drawings are referred to using the same numerical reference.

FIG. 1 is a topside elevation of a multi-density shoe insert constructed in accordance with an embodiment of the present invention;

FIG. 2 is a cross-sectional elevation view of a shoe insert constructed in accordance with FIG. 1; and

FIG. 3 is a flowchart illustrative of one method of construing a multi-density shoe insert consistent with the present invention.

DETAILED DESCRIPTION

The present invention will be described with reference to FIGS. 1-3. While the present invention is shown and described with regard to a running shoe, one of ordinary skill in the art would recognize on reading the disclosure that alternative shoes styles could use the invention described herein, and the use of a running shoe is exemplary and non-limiting. Other styles of shoes that would benefit from the present invention include, without limitation, cycling shoes, sport cleats, basketball shoes, tennis shoes, and walking shoes

FIG. 1 shows a top elevation view of a multi-density lasting board 100 constructed in accordance with the present invention. While described as a lasting board fused to the sole during manufacturing (see FIG. 3 form more details on construction), one of ordinary skill in the art would recognize on reading the disclosure that board 100 could be designed as an insert to be inserted into a shoe subsequent to manufacturing. Such an insert could be inserted and permanently attached or inserted such that it is removable.

Board 100 comprises a heel portion 102, a mid-shoe portion 104 or midsole portion, and a toe box 106. Board 100 comprises at least two, but in this example, three different density foam sections. Largely, board 100 comprises a first density foam 108. Board 100 also comprises a second density foam 110 in the high impact areas of heel 102 and the metatarsal section of toe box 106. In this case, a third density foam 112 is located at the ball of the foot in toe box 106. As shown, second density foam 110 and third density foam 112 are substantially contained in first density foam 108.

Foams 108, 110, and 112 can be comprises of the same or different types of foams. Some types of foams include ethyl vinyl acetate foams, polyurethane forms, neoprene foams, and the like. All the foams could be open or closed cell foams as a matter of design choice. Moreover, the foams could be designed with moisture removal devices, such as, for example absorbents 114 or wicking materials 116. Absorbents 114 and wicking materials 116 are generally known in the art and will not be further explained herein. See for example, United States Patent No. 6,493,966, titled SOLE STRUCTURE FOR A SHOE OR AN INNER SOLE, issued December 17, 2002, to Braun, incorporated herein by reference and United States Patent No. 6,432,504, titled COMPOSITE TEXTILE FABRIC HAVING MOISTURE MANAGEMENT, issued August 13, 2002, to Yeh, incorporated herein by reference.

The actual locations of foams 110 and 112 (or more or less depending on the number of different density foams desired) are based on simple biometrics generally known in the art. Based on the biometrics, such as anatomy, gait, and the like, higher or lower density foams may be located.

Additionally, the increase or decrease in density can be calculated from the same biometrics. In the positions shown, foam 108 is a first density, foam 110 is a second lower density, and foam 112 is a third lowest density. In generally, the relatively higher density foams are placed under those sections of the foot that collapse, such as the toes, to provide added support to those areas. Relatively lower density foams are placed under more rigid areas of the foot, such as the heel to provide cushion. Using softer, less dense foams under areas of the foot that are rigid in combination with harder, more dense foams under the collapsing areas, the multi-density lasting board assists in guiding the foot through the gait cycle, heel to toe action. In some applications, it maybe desirous to have higher density foams under rigid areas of the foot and/or lower density foams under collapsible areas of the foot. Board 100 shows placement of foams 108, 110, and 112 assuming a running shoe. If, for example, board 100 was for a cycling shoe, foam 110 is heel portion 110 and may be removed because the heel is not subject to high impact. Placement of the different density foam is related in part to the use of the shoe.

Referring now to FIG. 2, a cross-sectional view of lasting board 100 is shown. In this case, lasting board 100 is shown mounted on a sole 202 of a shoe, including upper 206 (of which only a portion is shown). Sole and upper 206 define an internal cavity 208. Lasting board 100 is coupled to sole 202 using an adhesive layer 204. Adhesive layer 204 is generally known in the art and will not be further explained herein. Adhesive layer 204 can be a number of different materials, but it has been found that general purpose footwear cements that are heat activated and polyurethane based work well.

Referring now to FIG. 3, a flowchart 300 is provided illustrative of an method of constructing the lasting board described above. First, the lasting board is constructed out of a first density foam, step 302. One or more portions of the lasting board are removed, such as by die cutting, in locations where a second density foam (or a third density foam, etc.) is desired, step 304. For example, in FIG. 1, a section consistent with second density foam 110 was removed from heel portion 102 of lasting board 100. Other density

foam sections are constructed to be inserted into the portions removed in step 304, step 306. The other density foam sections are inserted into the removed portions, step 308, and fused to the first density foam, step 310, such as by a heat activated adhesive or the like.

Optionally, a section of second density foam could be removed, such as by die cutting, and a third density foam, or the first density foam, could be inserted into the second density foam as desired.

Lasting board 100 could be sold as an insert to be inserted into a shoe by a user. Optionally, however, lasting board 100 is placed on sole 202, step 312, and adhered to sole 202 using an adhesive 204, step 314.

While the invention has been particularly shown and described with reference to an embodiment thereof, it will be understood by those skilled in the art that various other changes in the form and details may be made without departing from the spirit and scope of the invention.